

AMENDMENTS TO THE CLAIMS

The listing of claims provided below will replace all prior versions, and listings, of claims in the application.

Listing of Claims

1-15. (Canceled)

16. (Currently amended) A method for treating raw elongate material suitable for use in a paper making plant comprising:

extracting contrary material, which comprises contaminants found in the raw material,
from the raw material;

crushing the raw material from which contrary material has been removed to remove
nodes therefrom; splitting the crushed raw material lengthways;

supplying the crushed raw material to a co-rotating screw conveyor divided into a
plurality of zones and processing said material in said conveyor to produce pulp and a black
liquor effluent wherein the co-rotating screw conveyer further comprises a first section, a second
section, and third section, wherein the first and third sections have flights going in a first
direction, and the second section has flights going in a second direction which is reverse to the
first direction;

supplying treatment material to at least one zone;

controlling the temperature and/or pressure of at least one zone; and

spraying concentrated black liquor into a processing vessel in the form of a fluidised bed
reactor for treatment of said black liquor, said processing vessel being part of treatment material
and energy recovery means.

17. (Original) The method of claim 16, wherein the extraction of contrary material takes place on a conveyor belt provided with means for enabling the removal of contrary material.
18. (Original) The method of claim 16, wherein the crushing of the raw material takes place between a pair of counter rotating knurled rollers between which the raw material passes.
19. (Original) The method of claim 16, wherein the splitting of the crushed material takes place between a pair of counter rotating pinned rollers and between which the crushed material passes.
20. (Original) The method of claim 16, wherein, between the steps of crushing the raw material and splitting the crushed material, further removal of contrary material present in the crushed material is carried out.
21. (Original) The method of claim 16, comprising
addition of heat, steam or other treatment materials at any point along the co-rotating twin screw conveyor, and/or
extraction of liquids or volatiles at any point along the co-rotating twin screw conveyor.
22. (Original) The method of claim 16, wherein there is an increase or decrease of pressure at any point within the corotating twin screw conveyor.
23. (Original) The method of claim 16, wherein the crushed raw material is passed through a screw conveyor having at least three zones comprising a feed zone, a treatment zone to which treatment material is added and a pressure zone maintained at a pressure above atmospheric.

24. (Original) The method of claim 16, wherein the crushed raw material is passed through a screw conveyor having five zones comprising a feed zone, a treatment zone to which treatment material is added, a first pressure zone at a pressure greater than atmospheric to which treatment material is added, a second pressure zone at a pressure higher than the first pressure zone and a third pressure zone at a lower pressure than the second pressure zone.
25. (Original) The method of claim 24, comprising controlling the pressure and temperature of the first and third pressure zones to be the same.
26. (Original) The method of claim 24, comprising inserting steam into the treatment zone and inserting pulping agents into the first pressure zone.
27. (Original) The method of claim 24, comprising maintaining the feed zone and the treatment zone at atmospheric pressure.
28. (Original) The method of claim 24, wherein calcium hydroxide is added to the first pressure zone.
29. (Original) The method of claim 16, comprising
passing the black liquor at a concentration of 10-70 % solids to the processing vessel, and
treating the concentrated liquor therein at a temperature of between 300-650C.
30. (Original) The method of claim 29, comprising concentrating the liquor to 30-70% solids before passing it to the processing vessel.

31. (Original) The method of claim 16, comprising receiving black liquor from a co-rotating twin screw conveyor at above 30% solids, passing the concentrated liquor to the processing vessel and treating the concentrated liquor therein at a temperature of between 300-650C.

32. (Original) A method of claim 16, including spraying the concentrated black liquor into the chamber of a toroidal fluidised bed containing an earth oxide at a ratio of between 0.2:1 and 1.3:1 earth oxide to black liquor dry solids and set up under stoichiometric or sub-stoichiometric conditions.

33. (Original) The method of claim 32, wherein the concentrated black liquor is fed into a twin screw conveyor with an earth oxide, the ratio of earth oxide to black liquor dry solids being between 0.2:1 and 1.3:1 so that it becomes a granular friable material.

34. (Original) The method of claim 16, including chemically converting the material in the fluidised bed into sodium hydroxide and/or sodium carbonate and a gas and liquids with a combustible component which can be utilised for energy production.

35. (Original) The method of claim 16, wherein the raw elongate material is straw.

36-38. (Canceled)

39. (Currently amended) A method of pulping pre-treated raw material comprising passing the raw material through a plurality of zones in a co-rotating twin screw conveyor, wherein the co-rotating screw conveyer further comprises a first section, a second section, and third section, wherein the first and third sections have flights going in a first direction, and the second section has flights going in a second direction which is reverse to the first direction, inserting treatment

material into at least one zone and controlling the temperature and/or pressure of at least one of the zones.

40. (Canceled)

41. (Currently amended) The method of claim 16 further ~~A method of treatment of black liquor produced in a paper manufacturing plant comprising~~[[,]] passing the liquor at a concentration of 10% to 70% ~~1070 %~~ solids to a processing vessel and treating the concentrated liquor therein at a temperature of between 300-650C.